

Preliminary Site Closeout Report
Metamora Landfill Site
Metamora, Michigan

EPA Region 5 Records Ctr.



205402

I. Introduction

This Preliminary Close Out Report documents that the United States Environmental Protection Agency (U.S. EPA) has completed all construction oversight activities for the Metamora Landfill Site in Metamora, Michigan in accordance with Procedures for Completion and Deletion of National Priorities List Sites and Update (OSWER Directive 9320.2-09A-P). U.S. EPA and the Michigan Department of Environmental Quality conducted a pre-final inspection on September 24, 2001, and determined that the contractor has constructed the remedy in accordance with the Remedial Design (RD) plans and specifications. The Potentially Responsible Parties (PRPs) have initiated activities necessary to achieve performance standards and site completion.

II. Summary of Site Conditions

Background

The Metamora Landfill site is located in Metamora Township, Lapeer County, Michigan approximately one-half mile east of the village of Metamora, and 8 miles east-southeast of Lapeer, Michigan. The site is a 160- acre closed landfill (the landfill is approximately 25 acres in size) that accepted industrial and municipal waste between 1955 and 1980. The Landfill was formed by filling pits created by earlier gravel mining operations and as many as 35,000 drums have been buried in the landfill. An active licensed solid waste transfer station currently operates in the western area of the site. The surrounding land use is both residential and agricultural. (Figures 1 & 2) The site was proposed to the National Priorities List (NPL) on September 8, 1983, and became final on the NPL on September 21, 1984.

The site geology is variable, but generally consists of unconsolidated sand and gravel that are 250-300 feet thick in some locations, underlain by a clay/ till unit. Groundwater occurs at an average depth of about 100 feet below ground surface, with the deep aquifer about 300 feet below ground surface. Groundwater flows from the south-central part of the site to the northwest and northeast.

Site History

From 1982 to 1990, many studies were performed at the Site. Operable Unit (OU)1 addresses source control actions for drums and soils in Drum Areas 1 and 4 pursuant to a 1986 Record of Decision (ROD). OU2 addresses the capping of the landfill and treatment of the contaminated groundwater. The remedy for OU2 is embodied in the ROD dated September 28, 1990. However, on August 28, 1996, an amendment was applied to the 1986 OU1 ROD. Specifically, the ROD amendment presented an alternative for soil remediation in Drum Area 1. The drums in Drum Area 4 and soil have been remediated as specified in the OU1 ROD. The OU1 ROD selected off-site incineration of drums and soil in Drum Area 1 and Drum Area 4. The State began this remedial action in the spring of 1989 and continued until December 1990.

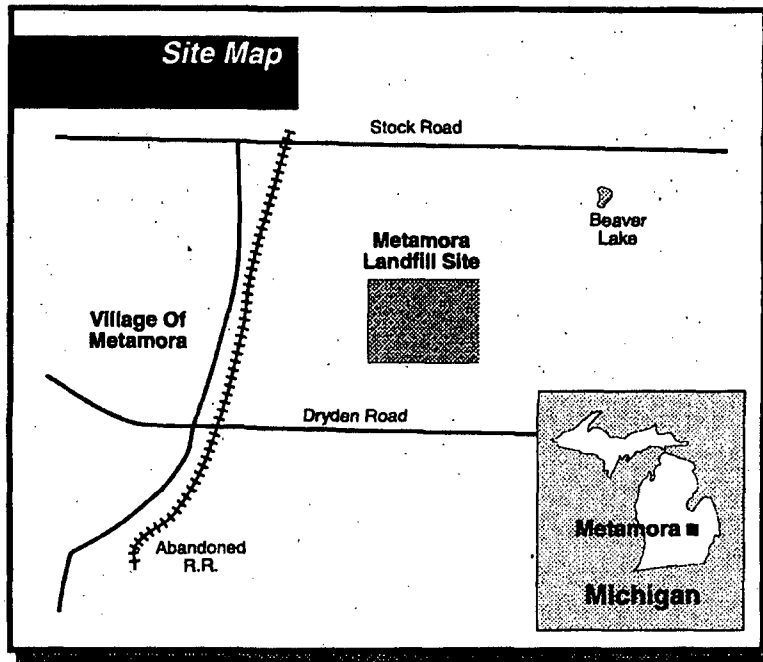


Figure 1

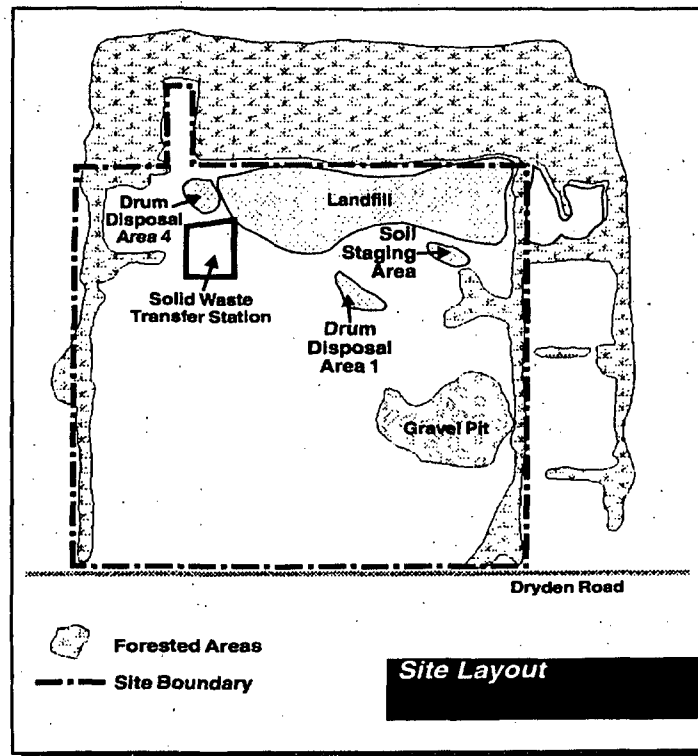


Figure 2

During the summer of 1990, off-site incineration capacity became extremely limited and drums awaiting disposal began to accumulate at the site. In addition, many more drums were discovered than originally estimated in the Remedial Design. This, in combination with the new RCRA Land Ban regulations, began to affect remedy implementation. In November 1990, negotiations began with Potential Responsible Parties for Remedial Design/Remedial Action (RD/RA) for OU2. In April of 1991, a settlement was reached that addressed the completion of all remedial activity remaining at the site, including the completion of OU1. In September 1991, an Explanation of Significant Differences (ESD) was issued, but never implemented, to allow for the option of on-site incineration of drummed waste and contaminated soils of Drum Area 1. Drum Area 4 had already been completed. The consent decree was entered by the federal court on March 17, 1993. Off-site incineration of Drum Area 1 drums and severely contaminated soils continued in November 1993, and was completed in November 1994.

The 1996 ROD amendment for OU1 addressed the final remedy for remediation of contaminated soils. The amendment to the OU1 ROD incorporates the remediation of Drum Area 1 soils and the Soil Staging soils into the cap portion of the OU2 remedy. Remediation of the contaminated soil was completed in March 2000 and therefore, implementation of the ESD for on-site incineration was unnecessary.

The remedy selected for OU2 addressed the remaining principal threats, namely the landfill and contaminated groundwater (pump and treat). The results of the analysis of the groundwater since the 1990 ROD are presented in the Conceptual Site Model Report, (CSMR) dated June 2001. The results of the study indicated that the groundwater was naturally attenuating and that the groundwater no longer requires containment. The CSMR evaluated the U.S. EPA's guidance on the use of MNA at Superfund sites as presented in OSWER Directive Number 9200.4-17P entitled "*Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tanks Sites*" (U.S. EPA, April 1999) and applied that guidance to Site conditions. The results of the natural attenuation evaluation for the Site indicate that natural attenuation processes, including biodegradation, are effectively attenuating Site-related Volatile Organic Compounds (VOCs) in both the Shallow Aquifer and Intermediate Aquifer.

The Shallow Aquifer has been the subject of numerous natural attenuation evaluations from 1995 to present. These evaluations have consistently indicated that natural attenuation processes have been attenuating Site-related VOCs in the Shallow Aquifer groundwater. The evidence of this includes:

1. Concentrations of chlorinated ethanes and ethenes have remained relatively stable, and in some cases decreased, over time;
2. Mass reduction along the groundwater flow path as evidenced by decreasing mass of total chlorinated ethanes and total chlorinated ethenes along the flow path;
3. Presence of the degradation products of chlorinated ethane and ethene parent compounds;
4. Presence of the cis-1,2-DCE isomer at a higher ratio than the trans-1,2-DCE isomers and the 1,1-DCE which indicates that biodegradation is occurring;

5. Redox conditions conducive to the anaerobic biodegradation of chlorinated solvents; and
6. Presence of an organic carbon supply in the form of landfill leachate.

Furthermore, the Shallow Aquifer is influenced by the presence of the thick vadose zone with numerous perched zones overlying the Shallow Aquifer, which results in the removal of a substantial portion of VOC mass from the interstitial water as it infiltrates through the unsaturated zone.

The CSMR also presents the Intermediate Aquifer natural attenuation evaluation. The results of this natural attenuation evaluation indicated that natural attenuation processes are attenuating Site-related VOCs in the Intermediate Aquifer groundwater. The evidence of this includes :

1. Mass reduction along groundwater flow path as evidenced by decreasing mass of total chlorinated ethanes and total chlorinated ethenes along the flow path;
2. Presence of the degradation products of chlorinated ethane and ethene parent compounds;
3. Presence of the cis-1,2-DCE isomer at a higher ratio than the trans-1,2-DCE isomers and 1,1-DCE which indicates that biodegradation is occurring;
4. Redox conditions conducive to the anaerobic biodegradation of chlorinated solvents; and
5. Presence of an organic carbon supply.

The CSMR also demonstrates that MNA is protective of human health and the environment, and therefore, meets the objectives of both the ROD and the OSWER Directive. A ROD amendment selecting monitored natural attenuation (MNA) for remediating the groundwater was signed September 27, 2001.

This ROD Amendment does not change the 1990 ROD requirements for landfill capping and landfill gas control. The cap meeting state ARARs has been substantially completed. The landfill gas control system being installed in conjunction with the cap is a modified system which will meet the ROD objectives of ensuring that unsafe levels of explosive gases do not migrate away from the landfill and that other hazardous gases are not present in the ambient air at the site in unsafe levels. The 1990 ROD specifies that the landfill gas should be collected and flared, but during the design of the cap, U.S. EPA agreed that the gas could be safely vented to the atmosphere without combustion. Long-term monitoring of the gas control system will be conducted to ensure that this system remains protective and meets all ARARs.

Institutional controls at the site include the following:

- Installation of fencing to restrict access to areas of the Site where certain remedial measures are to be installed;

Deed restrictions to limit use of groundwater at and downgradient from the Site and to assure that future use of the Site will not damage or otherwise impair the effectiveness of the cap, and gas collection and venting system.

The fence is currently in place. Deed restrictions will be put in place by April, 2002. Groundwater monitoring is the responsibility of the PRPs. An O&M plan for long-term monitoring is being prepared by the PRPs.

III. Remedial Construction Activities

The major components of this remedial action include the following:

- The drums in Drum Areas 1 and 4, and soil have been remediated as specified in the OU1 ROD;
- Excavation of approximately 40,000 cubic yards of Drum Area 1 contaminated soil;
- Excavation of approximately 660 cubic yards of Soil Staging Area soils;
- Placement in separated areas on the landfill, and capping of these materials under the OU2 landfill cap;
- Regrading and seeding of Drum Areas 1 and 4;
- Implementation of the OU2 remedy, as described in the 1990 ROD and 2001 ROD Amendment, consisting of a landfill cap with gas control, and monitored natural attenuation for the groundwater and institutional controls.

IV. Demonstration of Cleanup Activity QA/QC

Activities at the site were consistent with the RODs and ROD Amendments, and all work plans were issued to contractors for design and construction of the RAs, including sampling and analysis. The RD Report, including a Quality Assurance Project Plan, incorporated all U.S. EPA and State quality assurance and quality control (QA/QC) procedures and protocol. U.S. EPA analytical methods were used for all validation and monitoring samples during RA activities. Sampling of soil followed the U.S. EPA protocol Test Methods for Evaluation of Solid Wastes, Physical/Chemical Methods.

The QA/QC program used throughout the RA was rigorous in conformance with U.S. EPA and state standards; therefore, U.S. EPA and the State determined that all analytical results and QA/QC for construction are accurate to the degree needed to assure satisfactory execution of the RA and are consistent with the ROD and the RD plans and specifications.

V. Activities and Schedule for site completion

The following activities will be completed according to the following schedule:

	Estimated Completion	Responsible Organization
Complete Punch List Items	September 24, 2001	Contractor
Complete Final Inspection	October 26, 2001	EPA/State
Approve RA Report	December 30, 2001	EPA/State
Put in Place Deed Restrictions	April, 2002	PRP
Begin Deletion Process	September, 2031	EPA

VI. Summary of Remediation Costs

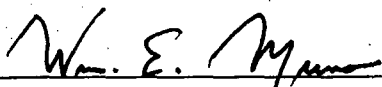
The first ROD estimated the total present worth cost of the drum and soil removal with off-site incineration at \$41.5 million. The 1996 ROD Amendment reduced the remaining cost of completing this remediation to \$381,000 by allowing the the combined Area 1 soils and Soil Staging Soils volumes of 30,900 cubic yards to be placed under the site cap. A cost estimate is not available for the incineration of contaminated soil and debris as part of the first ROD, before the 1996 ROD Amendment modified the remedy to capping the remaining soil.

The 1990 ROD estimated the total present worth cost of capping the landfill at \$5,340,000.

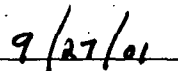
The total present worth of the MNA alternative is \$ 7.7 million based on thirty years of operation. These costs include the cost of monitoring well installation, the cost of preparing the CSMR and the cost of sampling for the next thirty years.

VII. Five Year Review

Because the amended remedy will result in hazardous substances remaining on-site, a statutory five-year review will be conducted at this site. As a five-year review has already occurred at this Site based on the implementation of the OU1 ROD Remedial Action, the next scheduled review is due before September 14, 2004.



 William E. Muno, Director
 Superfund Division



 Date